

The Cochylidii Fauna of the Palaearctic Region in Relation to that of the Remaining Regions (Tortricidae)

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The purpose of the present paper is to characterize the present state of knowledge on the Cochylidii fauna of the world, to compare the fauna of the Palaearctic Region with the faunas of the remaining regions, and to point out what is still to be done in the group in question both from the faunistic and systematic points of view.

The Palaearctic Region is the best studied area and the systematics of the Cochylidii have been built chiefly on that fauna. As our knowledge of the other faunas is insufficient the present taxonomic system of the group (here treated as a supertribe, but often considered a distinct family) is far from definite. The fact that important changes should be introduced to the present system at some future time on the basis of tropical material can be judged from the results of the study of the Neotropical Region (RAZOWSKI & BECKER, in print).

Characteristics of the regional faunas

THE PALAEARCTIC REGION

The revision of the Palaearctic Cochylidii was published in the series *Microlepidoptera Palaearctica* (RAZOWSKI, 1970a). The group treated as a distinct family, was represented by 271 species. Since then only 9 species have been described as new. This low number is to some degree due to a lack of new material from the more interesting countries and a rather superficial knowledge of other previously studied areas. This especially concerns Central Asia and China. Numerous species are known exclusively from their type localities, but that says little about their endemism. Also, the distribution of many common species is certainly greater than we now suppose. Table 1 compares the total number of known species in 12 selected areas with the number of endemics.

It is interesting that there is no endemic species in the Caucasus and Kazakhstan whilst in Afghanistan there are 15. In Central Europe only one species, *Aethes aurofasciana* MANN, can be treated as endemic. The Cochylidii larvae as a whole are stem- or root-borers or live in spun flowers and seeds of various plants, mainly *Compositae* and *Umbelliferae*. Only few species (e.g. *Hysterosia schreibersiana* TREIT., *Acornutia nana* HAW.) live on deciduous trees. The species thus show a preference for open areas and dry biotopes. It is therefore understandable that their number increases in the steppe zone of Asia.

Table 1

area/country	N. W. Africa	Spain	England	C. Europe	Asia Minor	Caucasus	Kazakhstan	Afghanistan	Mongolia	China	Japan	Primorskij Kraj
number of species	31	54	45	74	59	26	41	32	31	42	34	47
number of endemics	4	8	0	1	6	0	0	15	6	8	5	7

However, that our knowledge of the Cochylidii is so fragmentary, I would like to demonstrate by correlating the faunas of the above selected territories with each other. The coefficient of relationship (in percent) – x – is obtained from the formula $x = \frac{a}{A} \cdot 100$, in which a is the number of species common to two compared faunas and A is the total number of species of the less numerous fauna. Of the compared 12 territories the highest coefficient of relationship is between Central Europe and England (above 91 %) and between China and Japan (58.8 %). That between N.W. Africa and the Iberian Peninsula reaches 54.5 %, Spain and Asia Minor 42 % and Central Europe and Asia Minor 37 %. All the remaining faunas seem to correlate less well with each other, as the particular coefficients of relationship are in no case greater than 34.5 % (Kazakhstan and Mongolia). Somewhat different results are obtainable when comparing the particular genera. In that case the relationships among the southern lands are much higher (e.g. for *Stenodes* GUEN. or *Cochylis* TREIT.) than when looking at the whole group.

THE NEARCTIC REGION

The first species of *Cochylidae* have been described at the beginning of the second half of the last century by WALKER, WALSHINGHAM and ROBINSON,

then numerous species were discovered by KEARFOTT. BUSCK was the first to provide modern descriptions, but unfortunately no revision of the Cochylidii has been done, only some types of WALSINGHAM species have been published (RAZOWSKI, 1964). The Cochylidii are represented by 127 described species, the majority of which occur in the southern states of the U.S.A. The Nearctic fauna is closely related to that of the Palaearctic, as one can judge by the 5 genera and 3 species common to both regions. Certainly the fauna of the southern part of the region in question has much in common with the Neotropical fauna, however, only few Nearctic species have been discovered in Central and South America.

THE ORIENTAL REGION

Very little research into the Cochylidii fauna of this region has been undertaken. Apart from early publications by MEYRICK containing the descriptions of few species, there appeared recently two further papers bearing some more data on the Oriental Cochylidii, viz., that by DIAKONOFF (1976) that dealt with Nepal, and the revision of the genus *Eupoecilia* STEPH. by RAZOWSKI (1968a). Altogether only 26 species are recorded from this region of which 16 are known from the East Oriental Subregion. Six genera and 1 species (*Aprepodoxa mimocharis* MEYR.) are shared with the Palaearctic Region, but some further species should be found in the transition zone.

THE NEOTROPICAL REGION

The species of this region have been described by innumerable lepidopterists, the most important of which were ZELLER and WALSINGHAM. Several species have been described since by RAZOWSKI (1964) and CLARKE (1968). Recently the fauna of Brazil has been studied by RAZOWSKI & BECKER (in print). The over thirty new species and some new genera, discovered mainly in Parana and Santa Catarina, speak of the abundance of Cochylidii in this region. To date 148 species are known from this region, the majority of which have been described from Central America. The scarcity of distribution data and a lack of a revision of the Nearctic fauna do not allow for any generalised zoogeographical conclusion.

THE AUSTRALIAN REGION (inclusive Oceania)

Of the several species described from Australia most probably only one (*Phalonidia melissa* MEYR.) belongs to the Cochylidii. Apart from this, three *Eupoecilia* species have been discovered in Oceania and Papua.

THE ETHIOPIAN REGION

Only 17 new species described by MEYRICK, 1 by FELDER and ROGENHOFFER and 1 by BRADLEY are known from this large region. They are insufficiently studied and even their generic positions are doubtful except for the two members of the Ethiopian endemic genus *Trachybyrsis* MEYR.

Comments

Although the generic positions of the majority of the non-Palaearctic species are very often obscure, the share of the Palaearctic genera in the faunas of the remaining regions can roughly be shown (Table 2). The table is mainly based on unpublished data. The systematic positions of several species recently described in incorrect genera are here taken into consideration.

Table 2

Region	Palaearctic	Nearctic	Neotropical	Oriental	Australian	Ethiopian
genus						
<i>Trachysmia</i> Guen. = <i>Hysterosia</i> auct.	×	×	×	—	—	—
<i>Hysteroophora</i> Obr.	×	—	—	—	—	—
<i>Prohysteroophora</i> Raz.	×	—	—	—	—	—
<i>Phtheochroa</i> Steph.	×	—	—	—	—	—
<i>Stenodes</i> Steph.	×	—	—	×	—	—
<i>Phalonidia</i> Le March. <i>Saphenista</i> Walsm.	×	×	×	×	×	—
<i>Ceratoxanthia</i> Raz.	×	—	—	—	—	—
<i>Fulvoclysis</i> Obr.	×	—	—	—	—	—
<i>Agapeta</i> Hbn.	×	—	—	—	—	—
<i>Phtheochroides</i> Obr.	×	—	—	—	—	—
<i>Aprepodoxa</i> Meyr.	×	—	—	×	—	—
<i>Eugnosta</i> Hbn.	×	×	—	—	—	—
<i>Eupoecilia</i> Steph.	×	—	—	×	×	—
<i>Commophila</i> Hbn.	×	—	—	—	—	—
<i>Prochlidonia</i> Raz.	×	—	—	—	—	—
<i>Aethes</i> Billb.	×	×	×	×	—	—
<i>Cochylidia</i> Obr.	×	—	—	×	—	—
<i>Diceratura</i> Diak.	×	—	—	—	—	—
<i>Cochylis</i> Treit.	×	×	×	×	—	—
<i>Cryptocochylis</i> Raz.	×	—	—	—	—	—
<i>Falseuncaria</i> Obr. & Swatsch.	×	—	—	—	—	—

Of the 21 genera 12 are probably endemic to this region. *Stenodes* GUEN. and *Aprepodoxa* MEYR. are represented in the Oriental Region by single

species whilst the first mentioned is abundant in species in the Palaearctic region and the second is monotypical. *Eupoecilia* STEPH., known from our region with 10 species has 13 representatives in the Oriental Region (only 5 species in its Western Subregion), 3 species in the Australian Region (incl. Oceania and New Guinea) and most probably is of Oriental origin. *Eugnosta* HBN. is the only genus common for both the Palaearctic and Nearctic Regions exclusively and in the latter is represented by single species. *Trachysmia* GUEN. (= *Hysterosia* auct.) is also represented in the two last mentioned regions but also enters the Neotropical Region. However, it has never been noted from South America. The number of Nearctic species of that genus is almost as high as that of the Palaearctic Region and one species is even of Holarctic distribution. In Central America only few species of *Trachysmia* GUEN. occur and their distribution is very little known. The distributions of *Aethes* BILLB. and *Cochylis* TREIT. are almost identical. Both are abundant in species in the Holarctic Superregion and enter far into the Neotropical Region having a few representatives also in the Oriental Region.

One genus, *Phalonidia* LE MARCH., has an extremely broad repartition, as it is known from all regions but the Ethiopian. It is abundant in species in the Palaearctic, Nearctic and Neotropical Regions and is certainly well represented in the Oriental Region. Only one species has been found in the Australian Region. There is, however, a systematic problem which cannot be solved now. It is most probable that *Phalonidia* LE MARCH. is synonymous with *Saphenista* WALSM. and may be also with some other Neotropical genera.

To complete the above data the following review of non Palaearctic genera of the Cochylidii is provided. For each region the described genera not known from the Palaearctic Region are listed. A preliminary discussion on these genera has already been provided (RAZOWSKI, 1970b).

Nearctic Region : *Heinrichia* BUSCK, *Irazona* RAZ., *Lorita* BUSCK, *Carolella* COMST., *Thyralia* WALSM.

Neotropical Region : *Saphenista* WALSM., *Amallectis* MEYR., *Lasiothyris* MEYR., *Irazona* RAZ., *Lorita* BUSCK, *Carolella* COMST., *Aethesoides* RAZ., *Spinipogon* RAZ.

Ethiopian Region : *Trachybyrsis* MEYR.

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At lunch in the dining hall of Churchill College.

Left to right : P. S. Wagener, L. Gozmány, M. R. Gómez Bustillo, H. Epstein, R. F. Bretherton, G. de Viedma, E. de Bros, R. de Jong.

Photo S. Kager.